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10/729,328	12/05/2003	Joseph C. Deaton	87218AEK	1145

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EXAMINER

GARRETT, DAWN L

ART UNIT PAPER NUMBER

1774

DATE MAILED: 07/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/729,328

Applicant(s)

DEATON ET AL.

Examiner

Dawn Garrett

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 10,19,22-25 and 29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9,11-18,20,21,26-28 and 30-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Amendment*

1. This Office action is responsive to the amendment mailed May 16, 2006. Claims 6, 7, and 29 were amended. Claims 1-33 are pending. Applicant has indicated in the response that claim 29 is non-elected. Claims 10, 19, 22-25 and 29 are withdrawn. Claims 1-9, 12-18, 20, 21, 26-28, and 30-33 are under consideration at this time.

The present species under consideration are the following:

1a (page 10-Iridium piq), 8b (page 26-anthracene) and 5c (page 19-styryl amine), as set forth in Device Example 5. For Formula I, applicant has selected  $L_1 = L_2 =$  the third ligand;  $V_1 - V_6 = H$ ; Ar = atoms to complete a phenyl ring.

2. The objection to claim 29 set forth in the last Office action (mailed January 24, 2006), paragraph 2, is withdrawn due to the amendment.

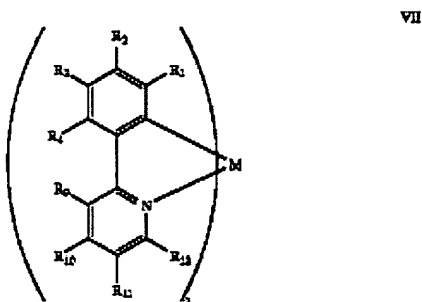
3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-9, 11-18, 20-21, 26-28, and 30-33 are again rejected under 35 U.S.C. 103(a) as being unpatentable over D'Andrade et al. (US 2002/0197511) in view of Chen et al. (US 2004/0247937), Hosokawa et al. (US 5,121,029) and Kwong et al. (US 2004/0241495).

D'Andrade et al. discloses OLEDs comprising an emissive region wherein the emissive region comprises a host material, and a plurality of emissive dopants, wherein the emissive region is comprised of a plurality of bands and each emissive dopant is doped into a separate band within the emissive region, and wherein at least one of the emissive dopants emits light by phosphorescence (see abstract). D'Andrade et al. teaches the region maybe comprised of

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multiple emitting layers (see par. 59). Although D'Andrade et al. does not appear to teach the specific phosphorescent compound Ir(piq) species currently under consideration, D'Andrade et al. generally teaches a phosphorescent dopant is desired for at least one of the emissive dopants (see abstract and par. 36). Kwong et al. teaches in analogous art the following compound formula as a phosphorescent emitting substance for an OLED (see page 2):



[0011] M is a metal atom;

[0012] each  $R^1, R^2, R^3, R^4, R^5, R^{10}, R^{11}$ , and  $R^{12}$  is, independently, H, F, Cl, Br, I, R, OR,  $N(R)_2$ , SR,  $C(O)R$ ,  $C(O)OR$ ,  $C(O)N(R)_2$ , CN,  $NO_2$ ,  $SO_2$ , SOR,  $SO_2R$ ,  $SO_2R'$ ; and additionally, or alternatively, any one or more of  $R^1$  and  $R^2$ , or  $R^2$  and  $R^3$ , or  $R^3$  and  $R^4$ , or  $R^5$  and  $R^{10}$ , or  $R^{10}$  and  $R^{11}$ , or  $R^{11}$  and  $R^{12}$ , together form, independently, a fused 4- to 7-member cyclic group, wherein said cyclic group is cycloalkyl, cycloheteroalkyl, aryl, or heteroaryl, and wherein said cyclic group is optionally substituted by one or more substituents X;

[0013] each R is, independently, H,  $C_1$ - $C_{20}$  alkyl,  $C_1$ - $C_{20}$  alkenyl,  $C_2$ - $C_{20}$  alkynyl,  $C_1$ - $C_{20}$  heteroalkyl,  $C_1$ - $C_{40}$  aryl,  $C_2$ - $C_{40}$  heteroaryl, aralkyl; wherein R is optionally substituted by one or more substituents X;

[0014] each X is, independently, H, F, Cl, Br, I, R', O, R',  $N(R')_2$ , SR',  $C(O)R'$ ,  $C(O)OR'$ ,  $C(O)N(R')_2$ , CN,  $NO_2$ ,  $SO_2$ , SOR',  $SO_2R'$ , or  $SO_2R'$ ;

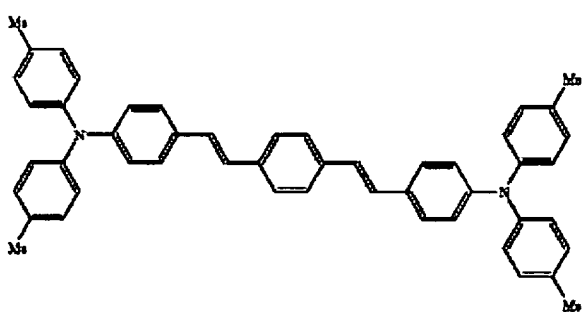
[0015] each R' is, independently, H,  $C_1$ - $C_{20}$  alkyl,  $C_1$ - $C_{20}$  perhaloalkyl,  $C_2$ - $C_{20}$  alkenyl,  $C_2$ - $C_{20}$  alkynyl,  $C_1$ - $C_{20}$  heteroalkyl,  $C_2$ - $C_{40}$  aryl, or  $C_2$ - $C_{40}$  heteroaryl; and

[0016] wherein at least one of  $R^1, R^2, R^3, R^4, R^5, R^{10}, R^{11}$ , and  $R^{12}$  is not H.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the iridium phosphorescent compound taught by Kwong et al. as a phosphorescent compound for the D'Andrade et al. device, because D'Andrade et al. teaches an emitting

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phosphorescent dopant is desirable for one of the light emitting layers. D'Andrade et al. further teaches an emissive layer with a fluorescent dopant and a host (see par. 41). Chen et al. teaches it is known in the art to form an emissive layer comprising TBADN (the anthracene species under consideration presently) doped with a luminescent fluorescent compound (see page 13, par. 133) and Chen et al. teaches that the condensed polycyclic compounds may be used in a major amount in the emissive layer (see par. 133 and Table 1-1). It would have been obvious to one of ordinary skill in the art to have selected TBADN as a host material for an emissive layer of the D'Andrade et al. device, because D'Andrade et al. teaches doped emissive layers and one would expect the emissive layer using TBADN taught by Chen et al. to be similarly useful in the D'Andrade et al. device. D'Andrade et al. fails to teach the following specific styryl fluorescent compound species currently under consideration, but does teach a fluorescent dopant is desired:



Hosokawa et al. teaches in analogous art the above formula as a light emitting material (see col. 33-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the above styryl compound as the fluorescent dopant for a D'Andrade et al. light emission layer comprising a fluorescent compound, because Hosokawa et al. teaches the compound is light emitting and one would expect the compound to be similarly useful as a light emitting compound in the D'Andrade et al. device.

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With regard to claims 2 and 11-18 D'Andrade et al. teaches the emissive region can be tuned with dopants to produce any color of light including white light (see par. 40).

With regard to claim 30, D'Andrade et al. teaches doping levels between 6% and 9% (see par. 79).

With regard to claims 31 and 32, D'Andrade et al. discloses display panels and light sources as applications for the OLEDs (see par. 2).

### ***Response to Arguments***

5. Applicant's arguments filed May 16, 2006 have been fully considered but they are not persuasive.

Applicant argues "There is no suggestion in the cited art to use an OLED device containing two light emitting layers with an iridium isoquinoline containing emitter in one of the emitting layers. It is believe that the data in the present application establishes unexpected results." The examiner agrees that the primary reference, D'Andrade, does not teach the specific phosphorescent emitter. D'Andrade does teach multiple emitting layers with a phosphorescent emitter in at least one of those layers. The secondary reference, Kwong, is used to teach 3-phenyl isoquinoline complexes as phosphorescent material for a luminescent device. Applicant notes Kwong does not test or show specific isoquinoline compounds. Non-preferred embodiments can be indicative of obviousness (see *In re Lamberti*, 192 USPQ 278 (CCPA 1976); *In re Boe*, 148 USPQ 507 (CCPA 1976); *In re Kohler*, 177 USPQ 399 (CCPA 1973)), and a reference is not limited to working examples (see *In re Fracalossi*, 215 USPQ 569 (CCPA 1982)).

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Applicant discusses Table 1 at page 48 in the instant specification with regard to unexpected results. The examiner does agree that Sample 1, the device comprising *fac*-tris(3-phenyl-isoquinolino)iridium (III), appears to exhibit greater stability than the other Samples in the Table. The experiments shown in Table 1 are not considered sufficient to establish clear and convincing unexpected results, because the devices tested in the experiments listed in Table 1 are not commensurate in scope with the claims. The devices of the samples only have one light emitting layer. Claim 1, the only independent claim, requires two light emitting layers. In addition, with regard to considering further phosphorescent species with an isoquinoline group in the application, Samples 1 and 2 are not fully commensurate in scope with the breadth of the claims, because only two isoquinolate organometallic complexes have been tested. Claim 1 recites "a phosphorescent light-emitting organometallic compound comprising iridium and an isoquinoline group" which is much broader than isoquinolate complexes tested in Samples 1 and 2.

### ***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dawn Garrett whose telephone number is (571) 272-1523. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached at (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Dawn Garrett  
Primary Examiner  
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